Discovering Roman Towns in Italy

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I'd like to start by challenging the preconception that archaeologists' main activity is digging. As an archaeologist, I spend much of my fieldwork not excavating but surveying the ground surfaces of Roman towns and producing wide range of new evidence that is providing exciting new information about urban development in Central Italy.

Although Roman towns are comparatively well-known, evidence relies heavily on two sets of excavated information. On the one hand we have the well-preserved towns of the Bay of Naples destroyed by Vesuvius in A.D. 79. Although Pompeii and Herculanium provide unparalleled insights into urban life in Campania in the first century A.D. these cities are probably untypical and we lack full information about their topographies and what happened in their more marginal areas. Elsewhere, many Roman cities in Italy are overlain by modern cities so excavation provides only 'key hole' views into them. Although such excavations can provide fantastic insights into particular aspects of these towns, it is very difficult to generalise these insights to understand whole towns.

Digging deep without a spade

It is against this background that we have been trying to gather some different information in Italy since 1997. Working together with the British School at Rome, Simon Keay (University of Southampton) and I have been leading a project, which applies contemporary archaeological survey technology to help understand a range of urban sites in the Tiber valley, upstream and downstream of Rome. Our aim has been to look at a variety of now-deserted urban sites, from the smallest roadside village to the huge harbour complex of Portus at the mouth of the Tiber. Instead of digging we are using surface surveys in an attempt to understand overall patterns of whole towns and how they changed through time.

Computer surveys

How do you achieve this without digging? The answer lies in the application of some very simple scientific methodology. We use a variety of techniques depending on the particular circumstances at individual sites. Whatever the circumstances of the site, we need to produce a detailed and accurate map of it that can be related to published maps. We use a computerized theodolite (called a 'total station') to produce this survey, which provides both a conventional topographic map and also enables us to record the location of our survey. The theodolite simply uses the familiar principles of trigonometry to locate topographic features (like field boundaries and track) and archaeological structures (remains of walls etc) and to provide a detailed contour map of the site. The advantage of the computer and its memory is that the calculations can be done much more rapidly than is conventionally possible and modern computer programs make it possible to produce accurate maps without ever putting pen to paper! In practice, topographical survey of this type requires members of the team to work across the site taking measurements every 5m or so. As they progress across the site, examining it detail, it is not uncommon to reveal partially buried and overgrown ruins, which are added to the map.

Mapping by magnet and electrical resistance

Our other standard method of survey uses what is generally call a magnetometer (technically a fluxgate gradiometer) which simply measures very slight differences in the magnetism of the soil. Buried structures commonly have a different magnetic signal from the surrounding soil, so the magnetometer can enable us to map them. The machine is carried systematically across the site within a grid surveyed onto the surface of the field and measurements are taken every 50cm. In the field this is a rather tedious process as someone has to walk up and down lines within a grid across the whole site. We divide the site up into 30m squares so the person carrying the machine walks a total of 1.8km to survey each square. On good terrain it is possible to cover about 1 hectare in a day with a single machine. Using the magnetometer in this way we aim to create a total picture of very minor variations in magnetism across each town. Each measurement is like a dot on a TV screen or a newspaper photograph and as buried buildings vary in the magnetism it is often possible to map these buried features. Over small areas these patterns are sometimes difficult to 'read', but given appropriate conditions and a large area it is possible to map the whole of Roman town fairly rapidly and with sometimes spectacular success. Our first attempt at this in Italy was at Falerii Novi where we were able to map the whole of a site covering about 28 hectares in extent in a period of not more than about 10 weeks work.

Other methods are used to supplement these basic techniques. At one extreme we have been using a resistivity meter which is used to take measurements of the electrical resistance of the soil. In principle, things like buried walls will have a higher electrical resistance than surrounding soil. By taking readings every 50cm across the site it is also possible to map buried features. However, although the technique is well-tried and commonly used in England, it is less useful in Italy because the very dry soil makes the electrical resistance very high, masking the signal of things like buried walls. It is also a rather awkward machine to use because it has to be attached to a long cable so surveying an area with trees or vines can take an enormously long time! Nevertheless, if used during the winter or spring it can provide useful detailed evidence to complement the results of the magnetometer survey, in particular in revealing more details of the plan of buried buildings.

Not to forget the old-fashioned method – collecting finds

The other less high-tech method we use is simply mapping and collecting finds from the surface of the fields. As ploughing rarely moves objects very far from their original place of burial, mapping the distribution of such finds can help us understand the shape of buried towns, not only showing which areas may have been in use at different times but also providing details of the architecture and decoration of buried buildings.

The techniques in practice at Falerii Novi

Our work in Italy has produced some spectacular results. At Falerii Novi our early success in the project provided an entirely new plan of the whole town showing the street grid, locating a full range of public buildings (baths, forum, temples, etc) as well as details of the layout of many private houses. This evidence has also enabled us to suggest some of the ways in which the town developed after its foundation sometime following 241 B.C. Although survey does not provide very refined evidence, it does offer a few surprises. For instance, the plan indicates that the great city walls are not original but rather later in date - perhaps a problem for those who have used the historical evidence for the foundation of the town as evidence far dating other town walls to latter part of the third century B.C. Perhaps more surprising is that by seeing the whole of the layout of the town we can understand more of its overall planning principles. Thus, we have identified a whole series of temples, but unlike other towns where excavation has been focused on those at the centre, at Falerii we have located a whole series of them around the inside of the wall circuit, but only in the northern half of the town and all facing south. We have still not absorbed the full implications of this for our understanding of the sacred geography of Roman towns.

... and Portus

The second site where we have made spectacular progress is Portus, the port of imperial Rome just to the north of the mouth of the Tiber and the earlier city of Ostia. Here our team has completed more than 120 hectares of survey on a site where little work has been possible for the past half century. This work has helped tie together the results of earlier isolated excavations, but it has also provided some spectacular new results. Most exciting, the survey has provided details of new features connecting the sea-port with the Tiber itself. We found details of a hitherto unknown canal associated with the Trajanic rebuilding of the site. The canal extends for some 1.4km and is about 35m wide and runs parallel with a Roman road and aqueduct for much of its length. Beside the canal we can identify a series of warehouses and workshops with surface evidence enabling us to date them and understand something of what they were used for. Beside the Tiber we have excellent evidence for a new settlement including a sanctuary site probably used by those approaching by river. Nearby, there is strong evidence for cemeteries, sadly confirmed by the surface evidence which produces bits of inscriptions and sculpture brought to the surface by modern ploughing.

Overall the importance of the results from Portus lies not in the different elements of detail that the survey has shown but rather the new overview of the site. By collecting the new information, standing back from it and seeing everything together we are beginning to develop a new view of the development of the whole imperial complex, appreciating especially the principles underlying its original planning. In this lies the importance of this type of work; it complements the detailed work of excavation providing the broader context within which whole sites can be better understood. Survey does not replace excavation but it is giving new perspectives on the Roman past.

Looking into the future

As I write this, I am preparing to go to Italy for the latest season, surveying the Roman city of Ocriculum (Otricoli in southern Umbria). Here our work in 2002 has already provided some new insights and I am confident there is more to discovery this year. Equally, I know that there are dozens more towns to keep us busy in future years. Archaeology can always be relied upon to provide new information about the Roman world.

Martin Millett is Laurence Professor of Classical Archaeology in Cambridge. He is best known as the author of The Romanization of Britain published by Cambridge University Press.